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engravings are good, showing with great detail the surface features of the island, pictorially and topographically. But to the naturalist and geologist, the second part, by M. Velain, is of greater interest. This volume is illustrated with twenty-seven quarto plates, eight of which are by the photoglyptic process, and are microscopic studies of the volcanic rocks. The island itself is of volcanic origin, and entirely composed of igneous rocks. This volume is a most elaborate monograph of the mineralogical and structural history of the island, by means of sections and colored maps, and it certainly is a model of careful study and bookmaking. Many actual volcanoes are shown to exist on the island, in operation at the present time. The publication of these important volumes is very creditable to the Government of France as well as to the authors.

M. Velain has recently published a small brochure of great interest in Bulletin No. 7 of the Mineralogical Society of France, on the microscopic study of the glass or slag resulting from the fusion of the ashes of grasses. It is illustrated with an excellent octavo plate showing the production, artificially, of the crystals of tridymite, anortheite, wollastonite and augite.—*F. V. H.*

SIGSBEE'S DEEP SEA SOUNDING AND DREDGING.[1]—It is greatly to the credit of American science and to our government, that it has taken so prominent a part in deep sea explorations. This is due largely to the labors and energy of the lamented Count Pourtales, who was a distinguished physical geographer and for a long time an assistant in the U. S. Coast Survey. He was the first to show that the warmer waters of the tropics, notably the Floridan seas, with their profusion of tropical life, were underlaid by a colder bottom stratum of water with a nearly equal profusion of what was hitherto supposed to be purely Arctic life. The Norwegian marine zoölogists had previously demonstrated the existence of a deep-sea fauna off the coast of Norway, and the Swedish naturalist, Lovén, had suggested that this deep sea fauna was widespread over the ocean bottom, but Pourtales demonstrated it, and the subsequent deep sea explorations of the English Navy, especially the Challenger Expedition, carried out and extended Pourtales' discoveries.

Pourtales was aided and advised by his friend Agassiz, and the work of exploration of the ocean bottom under the Gulf Stream off the Floridan peninsula, and in the Gulf of Mexico, as well as off the southern coast of the United States, has of late years been extended by the officers of the U. S. Coast Survey, Mr. Alexander Agassiz being the naturalist of the recent expeditions. The Coast Survey has now a beautiful steamer, the *Blake*, of 350 tons, built and equipped for the work of deep sea sounding and dredging. The successive officers, Commanders Howell, Sigsbee and Bartlett, especially Commander Sigsbee, have devised the most elaborate and effective machinery for this difficult work, and the present elegant volume gives in great detail the methods and instruments for studying the physics of the sea and for investigating the life of the ocean from the surface to the bottom, even to the abyssal depths; subjects bearing intimately on the physics, geology and biology of the globe. The Superintendent of the Coast Survey, after giving in a prefatory note the history of these undertakings, refers with pride to the fact "that in the small steamer *Blake*, of only 350 tons burthen, n. m., under the energetic and skillful commands of Lieut. Com. Sigsbee and Com. Bartlett, with a full complement of forty-five, including officers and crew, more rapid work was done than had been accomplished with the old methods and appliances by the *Challenger*, a vessel of over 2000 tons burthen, with a complement of twenty-nine naval and civil officers and a correspondingly large crew."

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[1] *United States Coast and Geodetic Survey.* CARLISLE P. PATTERSON, Superintendent. Deep sea Sounding and Dredging. A description and discussion of the methods and appliances used on board the Coast and Geodetic Survey Steamer *Blake*. By CHARLES D. SIGSBEE, U.S.N. Washington, D. C., 1880. 4to, pp. 192.

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